

WHAT IS CLAIMED IS:

- 1 1. A biologically pure culture of yeast of the genus *Kluyveromyces*,
2 wherein the culture is capable of proliferation in an aqueous medium comprising a pentose as
3 the sole carbon source.
- 1 2. The biologically pure culture of claim 1, wherein the pentose is
2 selected from the group consisting of xylose and L-arabinose.
- 1 3. The biologically pure culture of claim 1, wherein the yeast is of the
2 species *Kluyveromyces marxianus*.
- 1 4. The biologically pure culture of claim 1, wherein the yeast is SSSJ-0.
- 1 5. A biologically pure culture of yeast of the genus *Kluyveromyces*,
2 wherein the culture is capable of growth in an aqueous medium comprising cellulose or a
3 cellulose derivative as the sole carbon source.
- 1 6. The biologically pure culture of claim 5, wherein the cellulose or
2 cellulose derivative is selected from the group consisting of: carboxymethylcellulose, Avicel,
3 Sigmacell, and combinations thereof.
- 1 7. The biologically pure culture of claim 5, wherein the cellulose or
2 cellulose derivative is selected from the group consisting of: recycled paper sludge, brewer's
3 spent grain, corn stover hydrolysate, sugared lignin hydrolysate, and combinations thereof.
- 1 8. The biologically pure culture of claim 5, wherein the yeast is of the
2 species *Kluyveromyces marxianus*.
- 1 9. The biologically pure culture of claim 8, wherein the yeast is SSSJ-0.
- 1 10. The biologically pure culture of claim 5, wherein the culture is further
2 capable of fermenting the cellulose or cellulose derivative to ethanol.
- 1 11. A method of producing ethanol from an aqueous medium comprising a
2 saccharide selected from the group consisting of cellobiose, glucose, mannose, galactose, and
3 combinations thereof, the method comprising the steps of

4 (a) contacting an aqueous medium comprising a saccharide selected from
5 the group consisting of cellobiose, glucose, mannose, galactose, and combinations thereof,
6 with a biologically pure culture of claim 1; and

7 (b) incubating the aqueous medium under conditions wherein the
8 saccharide is fermented to ethanol.

1 12 The method of claim 11, further comprising the step of recovering the
2 ethanol.

1 13. The method of claim 11, wherein the aqueous medium is incubated at a
2 temperature between about 43 °C and about 45 °C.

1 14. The method of claim 11, wherein the yeast is of the species
2 *Kluyveromyces marxianus*.

1 15. The method of claim 14, wherein the yeast is SSSJ-0.

1 16. A method of producing ethanol from an aqueous medium containing
2 cellulose, the method comprising the steps of

3 (a) contacting an aqueous medium containing cellulose with a biologically
4 pure culture of claim 5; and

5 (b) incubating the aqueous medium under conditions wherein the cellulose
6 is fermented to ethanol.

1 17 The method of claim 16, further comprising the step of recovering the
2 ethanol.

1 18. The method of claim 16, wherein the aqueous medium is incubated at a
2 temperature between about 43 °C and about 45 °C.

1 19. The method of claim 16, wherein the yeast is of the species
2 *Kluyveromyces marxianus*.

1 20. The method of claim 19, wherein the yeast is SSSJ-0.

1 21. A method of producing a biologically pure culture of yeast capable of
2 growth in a medium comprising cellulose or a cellulose derivative as the sole carbon source,
3 the method comprising the steps of

- 4 (a) providing a sample of waste material comprising a yeast;
5 (b) culturing a yeast derived from the waste material in a medium
6 comprising cellulose or a cellulose derivative as the sole carbon source; and
7 (c) isolating a biologically pure culture of the yeast, thereby yielding a
8 biologically pure culture of yeast capable of growth in a medium comprising cellulose or a
9 cellulose derivative as the sole carbon source.

1 22. The method of claim 21, further comprising the step of culturing the
2 sample of the waste material in an enrichment medium containing glucose.

1 23. A method of producing a biologically pure culture of yeast capable of
2 growth in a medium comprising a pentose as the sole carbon source, the method comprising
3 the steps of

- 4 (a) providing a sample of waste material comprising a yeast;
5 (b) culturing the yeast in a medium comprising a pentose as the sole
6 carbon source, and
7 (c) isolating a biologically pure culture of the yeast, thereby yielding a
8 biologically pure culture of yeast capable of growth in a medium comprising a pentose as the
9 sole carbon source.

1 24. The method of claim 23, further comprising the step of culturing the
2 yeast in a medium comprising cellulose or a cellulose derivative.

1 25. The method of claim 23, further comprising the step of culturing the
2 yeast in an enrichment medium comprising glucose.

1 26. The method of claim 23, further comprising the step of culturing the
2 yeast in an enrichment medium comprising a pentose.

1 27. A method of producing a biologically pure culture of yeast capable of
2 growth in a medium comprising a hemicellulose or a hemicellulose derivative as the sole
3 carbon source, the method comprising the steps of

- 4 (a) providing a sample of a waste material comprising a yeast;
5 (b) culturing the yeast in a medium comprising hemicellulose or a
6 hemicellulose derivative as the sole carbon source, and

7 (c) isolating a biologically pure culture of the yeast, thereby yielding a
8 biologically pure culture of yeast capable of growth in a medium comprising a hemicellulose
9 derivative as the sole carbon source.

1 28. The method of claim 27, further comprising the step of culturing the
2 yeast in an enrichment medium comprising glucose.

1 29. The method of claim 27, further comprising the step of culturing the
2 yeast in an enrichment medium comprising a pentose.

1 30. The method of claim 27, further comprising the step of culturing the
2 yeast in an enrichment medium comprising a hextose.